

General

Title

Long-stay nursing home care: percent of residents with a urinary tract infection.

Source(s)

RTI International. MDS 3.0 quality measures user's manual, v9.0. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); 2015 Oct 1. 80 p.

Measure Domain

Primary Measure Domain

Clinical Quality Measures: Outcome

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the percent of long-stay residents who have a urinary tract infection.

Rationale

Nursing facility residents often develop infections (Nicolle et al., 1984; Magaziner et al., 1991; Finnegan, Austin, & Cape, 1985; Jackson et al., 1992; Strausbaugh & Joseph, 2000), and among these, urinary tract infections are the most common (Zimmer et al, 1986; Katz et al., 1990; Lee et al., 1992). Some residents who develop urinary tract infections develop blood infections, and 10 percent of these patients die within one week (Saint et al., 2006). Symptoms of urinary tract infections include fever, painful or difficult urination, increased frequency and urgency of urination, blood in the urine, lower abdominal or flank pain or tenderness, and deterioration in mental status (such as increased confusion). Using Minimum Data Set (MDS) 2.0 data for April to June 2009, the national prevalence of urinary tract infections in nursing facilities was 9.7 percent, with a range from a low average of 5.0 percent in Alaska to a high average of 14.3 percent in West Virginia (Centers for Medicare and Medicaid Services [CMS], 2009). The urinary tract

infection quality measure is the only measure in the current measure set that addresses infections. Thus, the urinary tract infection quality measure is a very important indicator of how facilities prevent and manage infections.

In a clinical review of the nursing home quality measures using the MDS 2.0, a Technical Expert Panel (TEP) organized by the University of Colorado concluded that the urinary tract infection quality measure is a "valuable source of information for nursing homes" (Brega et al., 2007). The measure prompts facilities to examine their approach to perineal care and their general infection rate. These infections have the potential for significant morbidity and mortality (Nicolle, 1993; Nicolle & SHEA Long-Term-Care-Committee, 2001).

Infections increase the use of medical care and costs. Since many urinary tract infections are related to catheters, this quality measure provides an additional incentive for the facility to monitor its catheter use (Gould et al., 2009).

Evidence for Rationale

Brega AG, Levy CR, Kramer AM, et al. Limited clinical review of publicly reported nursing home quality measures. Aurora (CO): University of Colorado; 2007.

Centers for Medicare and Medicaid Services (CMS). MDS 2.0 public quality indicator and resident reports. [internet]. Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); 2009 [updated 2012 Jun 18];

Finnegan TP, Austin TW, Cape RD. A 12-month fever surveillance study in a veterans' long-stay institution. *J Am Geriatr Soc*. 1985 Sep;33(9):590-4. [PubMed](#)

Gould CV, Umscheid CA, Agarwal R, Kuntz G, Pegues DA, Healthcare Infection Control Practices Advisory Committee. Guideline for prevention of catheter-associated urinary tract infections 2009. Atlanta (GA): Centers for Medicare and Medicaid Services (CMS); 2009.

Jackson MM, Fierer J, Barrett-Connor E, Fraser D, Klauber MR, Hatch R, Burkhart B, Jones M. Intensive surveillance for infections in a three-year study of nursing home patients. *Am J Epidemiol*. 1992 Mar 15;135(6):685-96. [PubMed](#)

Katz PR, Beam TR Jr, Brand F, Boyce K. Antibiotic use in the nursing home. Physician practice patterns. *Arch Intern Med*. 1990 Jul;150(7):1465-8. [PubMed](#)

Lee YL, Thrupp LD, Friis RH, Fine M, Maleki P, Cesario TC. Nosocomial infection and antibiotic utilization in geriatric patients: a pilot prospective surveillance program in skilled nursing facilities. *Gerontology*. 1992;38(4):223-32. [PubMed](#)

Magaziner J, Tenney JH, DeForge B, Hebel JR, Muncie HL Jr, Warren JW. Prevalence and characteristics of nursing home-acquired infections in the aged. *J Am Geriatr Soc*. 1991 Nov;39(11):1071-8. [PubMed](#)

National Quality Forum measure information: percent of residents with a urinary tract infection (long stay). Washington (DC): National Quality Forum (NQF); 2014 Jan 14. 29 p.

Nicolle LE, McIntyre M, Zacharias H, MacDonell JA. Twelve-month surveillance of infections in institutionalized elderly men. *J Am Geriatr Soc*. 1984 Jul;32(7):513-9. [PubMed](#)

Nicolle LE, SHEA Long-Term-Care-Committee. Urinary tract infections in long-term-care facilities. *Infect*

Control Hosp Epidemiol. 2001 Mar;22(3):167-75. [90 references] [PubMed](#)

Nicolle LE. Urinary tract infections in long-term care facilities. Infect Control Hosp Epidemiol. 1993 Apr;14(4):220-5. [37 references] [PubMed](#)

Saint S, Kaufman SR, Rogers MA, Baker PD, Boyko EJ, Lipsky BA. Risk factors for nosocomial urinary tract-related bacteremia: a case-control study. Am J Infect Control. 2006 Sep;34(7):401-7. [PubMed](#)

Strausbaugh LJ, Joseph CL. The burden of infection in long-term care. Infect Control Hosp Epidemiol. 2000 Oct;21(10):674-9. [44 references] [PubMed](#)

Zimmer JG, Bentley DW, Valenti WM, Watson NM. Systemic antibiotic use in nursing homes. A quality assessment. J Am Geriatr Soc. 1986 Oct;34(10):703-10. [PubMed](#)

Primary Health Components

Nursing home; long-stay; urinary tract infection

Denominator Description

All long-stay residents with a selected target assessment, except those with exclusions (see the related "Denominator Inclusions/Exclusions" field)

Numerator Description

Long-stay residents with a selected target assessment that indicates urinary tract infection within the last 30 days (see the related "Numerator Inclusions/Exclusions" field)

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

- Prior analyses of disparities among nursing home residents with regard to infection are limited. Analyses of the distribution of residents by race suggest that non-white populations are not evenly distributed across facilities. When the total number of skilled nursing facilities (SNFs) are broken down by the percentage of patients who are non-white, there is a large proportion of facilities that have non-white resident populations that are smaller than the national average (16.5% of United States [U.S.] population 60 and older [United States Census Bureau, 2012]). Half of facilities have 13 percent or fewer residents who are non-white. A quarter of facilities have less than four percent minority resident populations (RTI International, 2013).

- To examine whether facilities with higher percentages of non-white residents have different performance scores for long-stay urinary tract infection (LS UTI), analyses were completed comparing the performance of facilities based on their percentage of non-white residents. Facilities were sorted based on their percentage of non-white residents, and then divided into quartiles. Quartile 1 = 0 to 3 percent non-white (n=3,471); Quartile 2 = 3.1 to 13 percent non-white (n=3,376); Quartile 3 = 13.1 to 33 percent non-white (n=3,424), and Quartile 4 = 33.1 to 95 percent non-white (3,423). The percentile distributions of performance scores for facilities within these quartiles were then calculated and compared. Overall, there was little difference in the facility performance by proportion non-white residents. The mean for facilities increased as the proportion non-white residents decreased monotonically. Facilities in the quartile with the highest proportion minority residents was 4.97 percent, compared to the mean for facilities with the lowest proportion of minority residents at 6.86 percent (RTI International, 2013).
- To examine the potential for socio-economic disparities with regard to UTI, the developer examined the performance of this measure in facilities stratified by the proportion of residents who are Medicaid eligible, a limited measure of low socio-economic status. Specifically, facilities were stratified into two groups, facilities with greater than 75 percent of residents who are Medicaid eligible, and those that had less than 75 percent of residents who were Medicaid eligible. The mean for facilities with a higher proportion of Medicaid eligible patients was 6.00 percent, versus 7.07 percent for facilities with a lower proportion of Medicaid stays (RTI International, 2013).
- Although research suggests racial disparities in quality of care in nursing homes between African Americans and whites (Smith et al., 2007; Howard et al., 2002; Grabowski, 2004; Mor et al., 2004; Miller et al., 2006) and between Hispanics and whites (Fennell et al., 2010), no analyses have been conducted specifically examining racial disparities in nursing facilities with regard to urinary tract infections. The Agency for Healthcare Research and Quality report on healthcare disparities (2012) reported higher rates of catheter associated UTI among Hispanic adult surgery patients compared to non-Hispanic patients in 2009 and 2010. Higher rates of UTI were also observed among female surgery patients. These observations are based on a different population than the current measure, so do not suggest that a stratified measure is warranted, but monitoring for disparities in nursing homes is appropriate.

Evidence for Additional Information Supporting Need for the Measure

Agency for Healthcare Research and Quality (AHRQ). 2012 National Healthcare Disparities Report. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2013.

Fennell ML, Feng Z, Clark MA, Mor V. Elderly hispanics more likely to reside in poor-quality nursing homes. *Health Aff (Millwood)*. 2010 Jan-Feb;29(1):65-73. [PubMed](#)

Grabowski DC. The admission of blacks to high-deficiency nursing homes. *Med Care*. 2004 May;42(5):456-64. [PubMed](#)

Howard DL, Sloane PD, Zimmerman S, Eckert JK, Walsh JF, Buie VC, Taylor PJ, Koch GG. Distribution of African Americans in residential care/assisted living and nursing homes: more evidence of racial disparity. *Am J Public Health*. 2002 Aug;92(8):1272-7. [PubMed](#)

Miller SC, Papandonatos G, Fennell M, Mor V. Facility and county effects on racial differences in nursing home quality indicators. *Soc Sci Med*. 2006 Dec;63(12):3046-59. [PubMed](#)

Mor V, Zinn J, Angelelli J, Teno JM, Miller SC. Driven to tiers: socioeconomic and racial disparities in the quality of nursing home care. *Milbank Q*. 2004;82(2):227-56. [PubMed](#)

National Quality Forum measure information: percent of residents with a urinary tract infection (long

stay). Washington (DC): National Quality Forum (NQF); 2014 Jan 14. 29 p.

RTI International. RTI analysis of MDS 3.0 data (Quarter 3, 2013). All nursing home residents who meet measure inclusion criteria. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); 2013.

Smith DB, Feng Z, Fennell ML, Zinn JS, Mor V. Separate and unequal: racial segregation and disparities in quality across U.S. nursing homes. *Health Aff (Millwood)*. 2007 Sep-Oct;26(5):1448-58. [PubMed](#)

United States Census Bureau. American fact finder: population 60 years and over in the United States, 2012 American Community Survey 1-year estimates. [internet]. Washington (DC): United States Census Bureau; [accessed 2013 Dec 06].

Extent of Measure Testing

A joint RAND/Harvard team engaged in a deliberate iterative process to incorporate provider and consumer input, expert consultation, scientific advances in clinical knowledge about screening and assessment, Centers for Medicare & Medicaid Services (CMS) experience, and intensive item development and testing by a national Veteran's Health Administration (VHA) consortium. This process allowed the final national testing of Minimum Data Set (MDS) 3.0 to include well-developed and tested items.

The national validation and evaluation of the MDS 3.0 included 71 community nursing homes (NHs) (3,822 residents) and 19 VHA NHs (764 residents), regionally distributed throughout the United States. The evaluation was designed to test and analyze inter-rater agreement (reliability) between gold-standard (research) nurses and between facility and gold-standard nurses, validity of key sections, response rates for interview items, anonymous feedback on changes from participating nurses, and time to complete the MDS assessment.

Analysis of the test results showed that MDS 3.0 items had either excellent or very good reliability even when comparing research nurse to facility-nurse assessment. In most instances these were higher than those seen in the past with MDS 2.0. In addition, for the cognitive, mood and behavior items, national testing included collection of independent criterion or gold-standard measures. These MDS 3.0 sections were more highly matched to criterion measures than were MDS 2.0 items.

Improvements incorporated in MDS 3.0 produced a more efficient assessment: better quality information was obtained in less time. Such gains should improve identification of resident needs and enhance resident-focused care planning. In addition, including items recognized in other care settings is likely to enhance communication among providers. These significant gains reflect the cumulative effect of changes across the tool, including use of more valid items, direct inclusion of resident reports, improved clarity of retained items, deletion of poorly performing items, form redesign, and briefer assessment periods for clinical items.

Refer to *Development & Validation of a Revised Nursing Home Assessment Tool: MDS 3.0*. for additional information.

Evidence for Extent of Measure Testing

Saliba D, Buchanan J. Development & validation of a revised nursing home assessment tool: MDS 3.0. Baltimore (MD): Quality Measurement and Health Assessment Group, Office of Clinical Standards and Quality, Centers for Medicare & Medicaid Services; 2008 Apr. 263 p.

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Skilled Nursing Facilities/Nursing Homes

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Single Health Care Delivery or Public Health Organizations

Statement of Acceptable Minimum Sample Size

Specified

Target Population Age

All ages

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Aim

Better Care

National Quality Strategy Priority

Prevention and Treatment of Leading Causes of Mortality

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Data Collection for the Measure

Case Finding Period

Six months or two calendar quarters

Denominator Sampling Frame

Patients associated with provider

Denominator (Index) Event or Characteristic

Diagnostic Evaluation

Institutionalization

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions

All long-stay* residents with a selected target assessment, except those with exclusions

*Long-stay: An episode with cumulative days in facility (CDIF) greater than or equal to 101 days as of the end of the target period.

Exclusions

The target assessment is an admission assessment *or* prospective payment system (PPS) 5-day or readmission/return assessment.

Urinary tract infection value is missing.

Note: Refer to the original measure documentation for details.

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions

Long-stay residents with a selected target assessment that indicates urinary tract infection within the last 30 days

Note: Refer to the original measure documentation for details.

Exclusions

Unspecified

Numerator Search Strategy

Institutionalization

Data Source

Administrative clinical data

Type of Health State

Adverse Health State

Instruments Used and/or Associated with the Measure

Center for Medicare & Medicaid Services (CMS) Minimum Data Set (MDS) - Resident Assessment Instrument (Version 3.0)

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Rate/Proportion

Interpretation of Score

Desired value is a lower score

Allowance for Patient or Population Factors

not defined yet

Standard of Comparison

not defined yet

Identifying Information

Original Title

Percent of residents with a urinary tract infection (long-stay).

Measure Collection Name

Nursing Home Quality Initiative Measures

Measure Set Name

Long-stay Quality Measures

Submitter

Centers for Medicare & Medicaid Services - Federal Government Agency [U.S.]

Developer

Centers for Medicare & Medicaid Services - Federal Government Agency [U.S.]

RTI International - Nonprofit Research Organization

Funding Source(s)

United States (U.S.) Government

Composition of the Group that Developed the Measure

United States (U.S.) Government Staff, Clinical Experts, Researchers, and Statisticians

Financial Disclosures/Other Potential Conflicts of Interest

No conflicts of interest exist.

Endorser

National Quality Forum - None

NQF Number

not defined yet

Date of Endorsement

2014 Nov 10

Measure Initiative(s)

Nursing Home Compare

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2015 Oct

Measure Maintenance

Annual and (every three years) endorsement

Date of Next Anticipated Revision

Quarter 4 2016

Measure Status

This is the current release of the measure.

This measure updates a previous version: RTI International. MDS 3.0 quality measures user's manual. v8.0. Baltimore (MD): Center for Medicare & Medicaid Services (CMS); 2013 Apr 15. 80 p.

Measure Availability

Source available from the [Centers for Medicare & Medicaid Services \(CMS\) Web site](#)

.

For more information, refer to the CMS Web site at www.cms.gov .

Companion Documents

The following are available:

Saliba D, Buchanan J. Development & validation of a revised nursing home assessment tool: MDS 3.0. Baltimore (MD): Quality Measurement and Health Assessment Group, Office of Clinical Standards and Quality, Centers for Medicare & Medicaid Services; 2008 Apr. 263 p. Available from the [Centers for Medicare & Medicaid Services \(CMS\) Web site](#) .

Nursing Home Compare. [internet]. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS). 2000- [updated 2012 Nov 15]; [cited 2012 Nov 27]. This tool is available from the [Medicare Web site](#) .

NQMC Status

The NQMC summary was completed by ECRI on July 22, 2004. The information was verified by the measure developer on August 30, 2004.

This NQMC summary was updated by ECRI on November 28, 2005. The information was verified by the measure developer on February 8, 2006 and again on October 17, 2007.

This NQMC summary was retrofitted into the new template on June 28, 2011.

This NQMC summary was updated by ECRI Institute on August 15, 2013. The information was verified by the measure developer on December 3, 2013.

This NQMC summary was updated again by ECRI Institute on May 31, 2016. The information was not verified by the measure developer.

Copyright Statement

No copyright restrictions apply.

Production

Source(s)

RTI International. MDS 3.0 quality measures user's manual, v9.0. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); 2015 Oct 1. 80 p.

Disclaimer

NQMC Disclaimer

The National Quality Measures Clearinghouse[®] (NQMC) does not develop, produce, approve, or endorse the measures represented on this site.

All measures summarized by NQMC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public and private organizations, other government agencies, health care organizations or plans, individuals, and similar entities.

Measures represented on the NQMC Web site are submitted by measure developers, and are screened solely to determine that they meet the [NQMC Inclusion Criteria](#).

NQMC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or its reliability and/or validity of the quality measures and related materials represented on this site. Moreover, the views and opinions of developers or authors of measures represented on this site do not necessarily state or reflect those of NQMC, AHRQ, or its contractor, ECRI Institute, and inclusion or hosting of measures in NQMC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding measure content are directed to contact the measure developer.